

Application Serial No: 10/561,489  
Responsive to the Office Action mailed on: March 20, 2008

RECEIVED  
CENTRAL FAX CENTER  
JUN 20 2008

### IN THE SPECIFICATION

#### Amendments to the Abstract:

Please amend the Abstract as follows:

~~The present invention proposes a novel~~ A principle of blazing that is effective even in the resonance domain. ~~In the invention, light~~ Light (51) is made incident on a diffraction grating so that specular resonance can occur in two or more light scattering units including, for example, bispheres (11a, 21a; 12a, 22a), and by the specular resonance, a fraction of diffracted light 52 that is diffracted by the first layer (1) and the second layer (2) is selectively enhanced. ~~According to the invention, it~~ It also becomes possible to tune a blazing condition by a control signal from outside.

#### Amendments to the Specification:

Please amend the following at page 10, line 32-page 11, line 4 of the specification as follows:

When light  $k_i$  51 with a wavelength  $\lambda$  is incident from the direction (30) normal to the substrate (the z-axis direction) along the xz plane at an incident angle  $\alpha$ , the direction  $\theta$  that produces diffracted light  $k_o$  52 in the xz plane is given by the so-called grating equation  $\sin \theta = \sin \alpha + m\lambda/p$ , where  $m$  is an integer and a diffraction order.

Please amend the following at page 19, lines 1-14 of the specification as follows:

Although the diffraction gratings in which the first layer and the second layer are in close contact with each other can be fabricated easily, the inclination angle  $\delta$  of the bisphere units in the xz plane cannot be selected arbitrarily. In contrast to this, the diffraction grating illustrated in FIG. 8 can realize arbitrary  $\delta$  by the position matching in a plane. This diffraction grating requires precise controlling of the gap between the two substrates 10a and 10b, but the techniques of securing two flat surfaces at a small gap on the order of micrometers already have been in commercial use for liquid crystal displays and stacked diffraction optical elements for ~~camera-camera~~ lenses. Specifically, it is recommended that silica spheres with a uniform particle size or glass micro-rods may be mixed as spacers in peripheral adhesive portions, or protrusions serving as spacers may

Application Serial No: 10/561,489

Responsive to the Office Action mailed on: March 20, 2008

be formed in peripheral portions by a molding process. FIG. 8 illustrates silica sphere spacers as an example of the gap-retaining members 3.

Please amend the following at page 22, lines 17-26 of the specification as follows:

FIG. 15 illustrates, as another example of application of the diffraction grating, a grating coupler of an optical waveguide 9. As ~~show~~shown in FIG. 15, if recesses 50 for positioning light scatterers are processed in a location where a coupler is to be formed, it is possible to incorporate a diffraction grating at a predetermined location in a self-assembled manner. Since the diffraction grating according to the invention is equivalent to the one that is blazed, light does not propagate in both directions but can be guided only in a specific direction from the coupler. In this device, incident lights 53a and 54a are led into the optical waveguide 9 (diffracted light 53b) or led out from the optical waveguide 9 (diffracted light 54b).